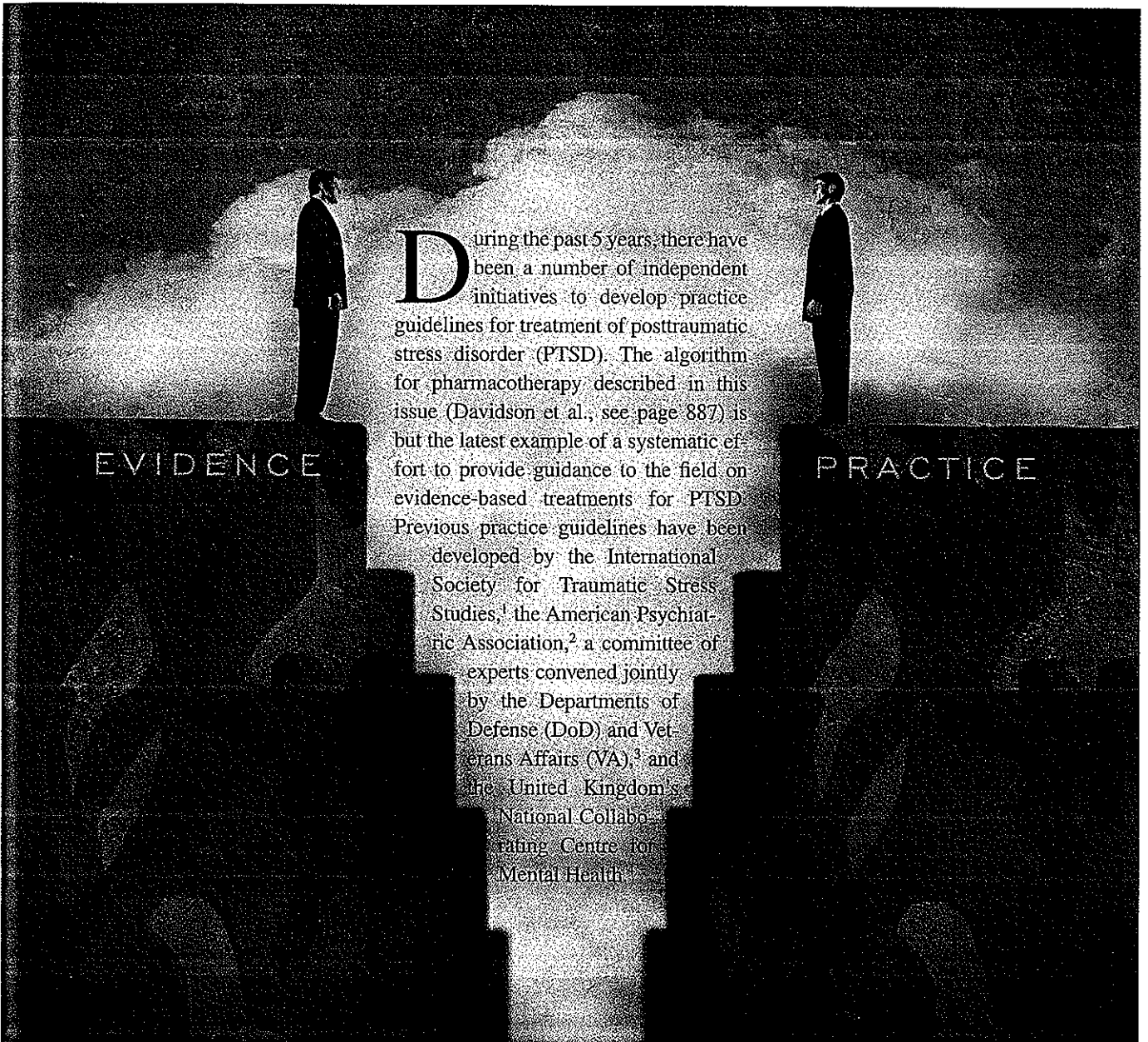# Toward a Knowledge Management System
for Posttraumatic Stress Disorder Treatment in Veterans Healthcare

During the past 5 years, there have been a number of independent initiatives to develop practice guidelines for treatment of posttraumatic stress disorder (PTSD). The algorithm for pharmacotherapy described in this issue (Davidson et al., see page 887) is but the latest example of a systematic effort to provide guidance to the field on evidence-based treatments for PTSD. Previous practice guidelines have been developed by the International Society for Traumatic Stress Studies,[1] the American Psychiatric Association,[2] a committee of experts convened jointly by the Departments of Defense (DoD) and Veterans Affairs (VA),[3] and the United Kingdom's National Collaborating Centre for Mental Health.[4]

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EDUCATIONAL OBJECTIVES

1. Describe the knowledge management (KM) process.

2. Discuss how one might initiate a KM process to promote evidence-based practice regarding treatment of posttraumatic stress disorder (PTSD).

3. Identify barriers to implementation of a new evidence-based practice for treatment of PTSD.

Unfortunately, development of such guidelines is only the first step in modifying clinician behavior. The next challenge, which we address in this article, is to design and implement a process by which evidence-based treatments are used by clinicians. This challenge is part of a larger process called knowledge management (KM).

.Definitions of knowledge management are varied but uniformly focused around organizational performance. Definitions stress that KM is a set of practices involving the guidance, creation, codification, dissemination, and evolution of knowledge for strategic ends[5,6] to enable "understanding and exploiting the role of knowledge in the processes of

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The authors have no industry relationships to disclose.

managing and doing work."[7] KM is intended to ensure competitive advantage and spur innovation so that "knowledge management must always be applied to enable organization success and never to store information for information's sake."[8] Guptill[9] stresses knowledge transfer for performance improvement, emphasizing "actionable" knowledge, and arguing that management of knowledge must be associated with behavior change. A key part of mental health-related KM is related to the dissemination of empirically-supported treatments and other "research products" (eg, assessment instruments, treatment manuals, continuing education workshops).[10]

Recognition of the gap between scientific evidence and clinical practice has prompted VA to consider developing a KM system to promote evidence-based practices throughout the VA system. The Comprehensive Veterans Health Administration (VHA) Mental Health Strategic Plan recommends that VHA develop a knowledge management system to "disseminate almost real-time, program specific education that will keep staff continuously apprised of new information on best practices and research," "link research, guideline development and implementation, clinical tools, sharing of best practices, and real-time data analysis," and "create a continuous expansion of the evidence base and increased knowledge generated by a spirit of inquiry" (VHA, internal communication, 2005). The VHA plan is strongly aligned with the strategic thinking outlined by the President's New Freedom Commission on Mental Health,[11] which recommended that front-line providers and professionals receive adequate training in the most advanced tools for diagnosis and treatment. It also emphasized the importance of circulating knowledge about evidence-based practices (treatments and services of well-documented effectiveness) and emerging best practices (treatments and services with a prom-

ising but less thoroughly documented evidence base).

Improving PTSD treatment has been selected as a pilot project for a recently convened VA Best Practices and Knowledge Management (BPKM) committee. Therefore, the initiative to be described has both general and specific goals. First, it seeks to develop and test the general feasibility of using KM techniques to improve clinician performance throughout the VA system. PTSD has been selected as the first of many possible disorders that could have been tested in this way. Second, it seeks to specifically improve the use of evidence-based best practices by VA clinicians treating patients with PTSD.

There are many reasons that PTSD was selected for this pilot phase of VA's Best Practices initiative. First, war zone-related PTSD ranks among VA's highest priorities because affected veterans have acquired this disorder during military service. Second, use of inpatient and outpatient services by veterans with PTSD represents a significant portion of VA's clinical caseload. Third, new cases of PTSD emerging from current deployments to Afghanistan and Iraq have made the implementation of Best PTSD Practices for many returning troops a very high priority. Fourth, recent development of joint VA/DoD practice guidelines for PTSD treatment has provided state-of-the-art guidance on evidence-based treatment.

In this article, we provide the context within which the VA initiative should be understood, identify those evidence-based PTSD practices that appear to be the most suitable first targets for KM approaches, and discuss the Knowledge Management process as we understand it at this point. We also address issues related to identifying best practices, modifying clinician behavior, developing clinician support for changes, pilot testing implementation strategies, and monitoring this process. In addition, we

discuss the major barriers we anticipate and how we hope to overcome them.

CONTEXT OF PTSD KNOWLEDGE MANAGEMENT IN THE VA HEALTH CARE SYSTEM

Within the VA system, PTSD is a major focus of care. Specialized outpatient, inpatient, and residential PTSD programs exist in all of the VA's 23 regions. At the close of 2004, there were 105 Specialized Outpatient PTSD Programs, 96 PTSD Clinical Teams, four Substance Use PTSD Teams, and five Women's Stress Disorder Treatment Teams. As of 2005, each region of the VA has a PTSD Coordinator who serves to facilitate PTSD services across the region. In addition, there are 206 Veterans Outreach Centers ("Vet Centers") that also address PTSD and other problems of readjustment to civilian life.

In 2004, 136,000 patients with PTSD were treated in general outpatient mental health settings, 16,158 were treated by PTSD specialists working in general mental health clinics, and 67,955 were seen in specialized PTSD Clinical Teams. An additional 24,031 were seen in primary care medicine and other non-mental health settings. As of April 2005, 9,688 Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans provisionally diagnosed with PTSD had been seen in VA medical centers and clinics. Allowing for those who had received services at both VA medical centers and community-based Vet Centers, a total of 11,224 individual OIF/OEF veterans with potential PTSD had been seen following their return from Iraq or Afghanistan.

It should be understood that a large amount of PTSD-related diagnostic and treatment activity takes place outside of PTSD specialty programs, in primary care medicine, general mental health clinics, substance abuse programs, wherever veteran patients with PTSD are found. In considering where to focus this effort at implementing best practices, a strategic decision has been made to begin with specialized PTSD services, with the understanding that successful management of PTSD in the VA system will require expansion into a range of settings.

DISSEMINATING BEST PRACTICES

Perhaps the preeminent reason for focusing on the implementation of PTSD Knowledge Management in VA is to enable a more effective dissemination of empirically supported treatments to those providing PTSD assessment and treatment. Within VA, best practices have been identified within the VA-DoD Clinical Practice Guideline for the Management of Traumatic Stress.[3] This guideline

has been approved formally by the VA, is based on an integrated consideration of existing research evidence and expert consensus, addresses management of PTSD in specialized mental health settings as well as in primary care medical settings, and covers acute traumatic stress reactions and chronic PTSD.

Development of such a guideline, however, is insufficient to change PTSD treatment practices significantly within VA. Evidence has shown that passive diffusion of guidelines (eg, printing guidelines) generally is ineffective in changing practice, and some research has indicated significant areas of disparity between current VA PTSD assessment and treatment practices and

guideline recommendations (eg, underuse of standardized PTSD assessment instruments, manualized treatments, and evidence-based treatments, specifically cognitive restructuring and exposure therapies; little use of validated measures when screening for PTSD in substance abuse programs).[12,13]

For all clinical domains, multiple structural, peer group (practice patterns determined by local standards and beliefs), professional, and patient factors may impede the adoption of practice guidelines and other best practices or practice changes. Such barriers include a lack of guideline awareness, lack of guideline familiarity, lack of agreement with a specific guideline or the concept

Evidence has shown that passive diffusion of guidelines (eg, printing guidelines) generally is ineffective in changing practice, and some research has indicated significant areas of disparity between current VA PTSD assessment and treatment practices and guideline recommendations.

of guidelines in general, other resistant attitudes and beliefs, lack of self-efficacy (the belief that one can actually perform a behavior), lack of outcome expectancy (expectation that a behavior will produce a particular outcome), inertia of previous practice, external barriers (time limitations, lack of a reminder system), guideline-related barriers (perceived difficulty of use, complexity), patient-related barriers (eg, contrasting patient preferences), and environment-related barriers (eg, lack of materials, insufficient staff).[10,14,15]

An effective KM system to support dissemination of guideline-concordant best practices will therefore need to address several component processes. These

include identifying and prioritizing best practices; assessing the context of dissemination; designing, executing, and monitoring an implementation pilot test; and expanding implementation to include PTSD settings throughout the VA system.

Identifying and Prioritizing Best Practices

A first question involves how to select and prioritize behavior change goals. As noted above, VA has a practice guideline that identifies evidence-based treatments and other best practices in management of PTSD. However, the guideline itself describes a large range of practices, and so any attempt to disseminate these must include a systematic parsing of the guideline into discrete clinician behaviors and

Barriers likely to be significant in efforts to influence VA PTSD treatment providers include such things as disagreement with aspects of guideline content, resistance to perceived infringement on practitioner autonomy, [and] lack of previous professional training related to evidence-based treatments.

prioritization of those behaviors in terms of relative importance of dissemination. Nonetheless, the guideline serves as a resource for informing behavior change efforts. As in all heathcare, there is likely to be some degree of disagreement among key stakeholders on the relative priority or legitimacy of different improvement strategies and elements,[16] so that, within VA, one means of reducing disagreement can be can be to base change decisions on the guideline.

The Best Practices and Knowledge Management committee has taken a first step in selecting key practices to be disseminated by identifying four initial change priorities that are consistent with

guideline recommendations. First, the best validated treatments for PTSD are cognitive-behavior therapy (CBT) interventions, two of which — cognitive-processing therapy[17] and prolonged exposure therapy[18] — have been selected as change priorities and recommended for pilot testing in VA. A second priority is to increase use of ongoing outcome monitoring during treatment, to inform treatment redesign, allow patient and clinician to better review their work together, and increase accountability of treatment. Such ongoing evaluation is not standard practice among mental health clinicians.[12] A third priority for practice change is to ensure that psychiatric prescribing of psychotropic medications is aligned with the recommendations of the clinical practice guideline. The final choice is the application of systematic, evidence-based assessment procedures during VA PTSD Compensation and Pension examinations.[19]

Within the VA, some common obstacles to dissemination of best practices are likely to be less problematic than in other service sectors. Training costs, while substantial, will not need to be absorbed by individual practitioners. Moreover, the VA is heavily committed to practitioner education and can be expected to provide release time or in-house training. The organization is concerned with quality of care, not just short-term cost containment, and the VA's Employee Education System is staffed to facilitate develop-

ment of educational initiatives. Lengths of empirically-supported treatments typically range from eight to 20 sessions, and although this length may preclude their delivery in some civilian managed care settings, they will be deliverable in many PTSD clinics. Diagnostic workups on patients are standard within VA; this is important because empirically supported treatments are often diagnosis-specific. And the VA employs many well-trained clinicians who, with adequate additional instruction, can be expected to deliver these treatments competently.

Barriers likely to be significant in efforts to influence VA PTSD treatment providers include such things as disagreement with aspects of guideline content, resistance to perceived infringement on practitioner autonomy,[20] lack of previous professional training related to evidence-based treatments, the nature of some evidence-based treatments (eg, they require preparation between sessions, weekly sessions, individual treatment, extra-session interventions such as in vivo exposure), and high workload (may reduce willingness to experiment and capacity to explore new treatment options).

The wide variety of potential barriers to dissemination means that any effort at changing practice should include: an assessment of the context of implementation for a given practice to identify product-specific barriers and enhancers;[20] a pilot test of implementation; and the design and application of a broader implementation program. In the paragraphs below, we discuss these components of dissemination generally, and explore issues related to their application in the case of one specific priority, the implementation of cognitive-behavior PE and CPT interventions for PTSD.

Assessing the Context of Dissemination

Assessment of the context of implementation for a given practice is an

important first step. As Shojania and Grimshaw note,[20] the history of quality improvement has been characterized by "presumptions about practitioners' needs and untested assumptions about effective means for addressing them." If a variety of potential barriers are not considered and identified before implementation, dissemination strategies may be less likely to adequately address the range of factors needed to be successful.[15] Barriers to a given PTSD-related practice must be assessed because they may differ from setting to setting. They will certainly differ, as well, according to the varying specific practice patterns targeted for change.

For example, obstacles may differ with respect to practitioner willingness to adopt a standard paper-and-pencil PTSD screening questionnaire, to increase or reduce prescribing of a particular medication, to engage in outcome monitoring, or to deliver a multisession manualized group treatment. Careful assessment of barriers is necessary before implementing change in order to inform the design of an implementation effort, and during pilot implementation to understand the effort as it is unfolding.

With regard to CPT and PE, there are likely to be multiple barriers to widespread implementation. A major structural barrier is likely to include, as suggested above, heavy clinician workload. The identified CBT treatments require many sessions of individual or group contact, which may place resource demands on many clinics. They also require, at least during an extended learning period, significant between-session preparation. These time demands suggest the possibility that, for some clinicians, there will be significant disincentives to learn and apply the new treatments. At present, there are no external incentive systems in place to counter these disincentives and reinforce delivery of these treatments. Moreover, there are no established training mechanisms

that would allow widespread training and supervision in the interventions.

The VA's Northeast Program Evaluation Center has already developed evaluation systems to monitor patient outcomes and other aspects of the performance of PTSD treatment services.[21,22] For many years, residential PTSD programs have been monitored routinely on a national basis, to inform treatment improvement. To enable a KM approach to be effective, such monitoring at the level of patient outcomes will need to be expanded to include outpatient PTSD services. It can be argued that a lack of outcome monitoring of outpatient PTSD programs is a structural barrier to dissemination of evidence-based treatments, since less effective treatment alternatives are not likely to be recognized as such. Similarly, the VA has been forward-looking in experimenting with measurement of what treatments are currently being delivered in VA PTSD programs. It will be important to establish a system for ongoing measurement of PTSD-related treatment practices, to identify clinics that are using evidence-based interventions, validate efforts to change practitioner behavior, and monitor associations between treatment practices and patient outcome.

Professional barriers are also likely to affect adoption of the interventions. Many clinicians will not have a cognitive-behavior theoretical orientation. Some may be advocates for other kinds of (nonempirically supported) interventions, based on training or interest. Some will argue that the identified CBT treatments will not be as effective with veterans with chronic PTSD as with other populations, or that many veterans with PTSD are "not ready" for CBT due to their lack of treatment motivation, lack of compliance with treatment, chronic problems, intense anger, suicidality, and so on. (These concerns may, if correct, be considered to be patient barriers; empirical research is needed to determine whether they are warranted). A large,

nearly completed, VA Co-operative Study testing the efficacy of PE among female veterans and active duty personnel with PTSD should address a number of these questions. Preliminary data suggest that these concerns can be managed adequately (Schnurr, Friedman, and Engel, 2005, personal communication).

PE, despite being a relatively well known treatment, is not currently widely used inside the VA[23] or outside.[24] Becker, Zayfert, and Anderson[24] found that common barriers to its use among civilian psychologists include lack of training (60% of practitioners), resistance to manualized treatments (25%), and fears of retraumatizing patients (22%). Anecdotal evidence suggests that these same factors affect VA practitioner attitudes. Also, use in VA may be affected by the fact that PE has not been effectively established as a group-administered treatment, and a large trial of group exposure therapy was not superior to a manualized treatment-as-usual in male veterans with chronic PTSD.[25] Cook, Schnurr, and Foa[26] have systematically considered many of the barriers to PE use and suggested ways of addressing them to bridge the gap between research and clinical practice.

Because the CBT interventions are new to most providers, the major professional barrier to dissemination is likely to be a widespread skills deficit and substantial training will be required to enable clinicians to deliver these treatments. In general, VA practitioners can be expected to show both positive and negative attitudes toward manualized treatments. Feedback from VA clinicians attending the National Center for PTSD Clinical Training Program suggests that, like their civilian colleagues, VA practitioners do have concerns that "slavish" adherence to manuals may interfere with a human connection between patient and therapist, restrict clinician autonomy, and result in a lack of individualization of treatment. However, these same clinicians report a strong desire to be effec-

tive in their practice and an interest in learning the most powerful treatments.

Peer group barriers may be a factor in some PTSD treatment settings, where a program or treatment approach has been developed that does not include CBT, and where staff are very invested in the existing approach. For example, some programs eschew trauma-focused treatments and emphasize attention to management of current-day problems.[27] Some may be organized around alternative procedures, such as eye movement desensitization reprocessing (EMDR)[28] or psychodynamic therapies. Managers or opinion leaders important to the adoption of new behaviors may have nonevidence-based opinions or other management priorities.

Avoidance of trauma reminders is a symptom of PTSD and, because both CBT interventions involve emotional re-experiencing of traumatic memories, the primary patient barrier is likely to be a desire to avoid distress associated with exposure to painful trauma memories and a reluctance to experience trauma-related emotions. Patients sometimes decline to participate or drop out of these treatments due to emotional discomfort. It is important to note, however, that empirical studies have to date shown that any symptom exacerbation is infrequent and temporary[29] and that there is no difference in dropout rates for PE compared with other CBTs.[30] The treatments also involve significant "homework" on the part of patients, some of whom may not wish to make such a commitment to treatment.

These potential patient obstacles can be reduced if the clinician is trained in skills of presenting a persuasive rationale for treatment, negotiating treatment goals, confronting non-compliance in effective ways, and reinforcing treatment participation. Also, the aforementioned VA Cooperative Study on PE treatment indicates that patient compliance and acceptability is high, although there have also been drop-outs from treatment

(Schnurr, Friedman, and Engel, 2005, personal communication).

Changing Clinician Behavior

There are many ways of increasing clinician use of evidence-based practices. These include implementation of incentive systems, changing policies to remove structural barriers, delivery of training and supervision, design or selection of clinician-friendly treatment protocols and manuals, and formal demonstration of the superiority of a given practice compared with standard care. Some research has suggested that multifaceted efforts that simultaneously address multiple barriers may be more effective than those employing single strategies of dissemination, but this is not a consistent finding. Of overarching importance is that "active" strategies for behavior change be employed; rather than simply increasing awareness or providing information about new practices, it is important that practitioners are trained in their use and supported as they implement changes.[31]

A fundamental key is getting provider buy-in. This is the most complex area of KM and really requires both "pull" and "push" approaches, with the most challenging of these components being the "pull": getting the providers to "own" the intervention as their own and feel they are moving in this direction by choice.

Selection of tools for changing practices should be used based on an assessment of the to-be-changed practices themselves and barriers specific to them. For the cognitive-behavior interventions selected for implementation within VA, key barriers are skills deficits, time and-workload constraints on learning and delivering a labor-intensive new treatment, and possible attitudinal difficulties. To address these barriers, training and supervision systems will be crucial. These are complex, multisession treatments with which few clinicians are familiar. Few will have received formal instruction in

evidence-based treatments during their professional career training,[32] evidence-based continuing education training in these interventions is not widely available, and manuals for the CBT treatments are also not widely disseminated although they are usually available upon request.

Part of what requires pilot testing is in fact the training protocol, to ensure that trained clinicians perform the interventions to criterion. Traditional in-service and continuing education training methods often are not adequate in intensity[33,34] and often have failed to impart the discrete skills that make up evidence-based practices.[35] Perhaps more important, they have not incorporated the training methods (eg, modeling, role play, feedback, homework)[36] and pairing of training with ongoing consultation and supervision[37] that can effect changes in practice. There are now several demonstrations that combinations of workshop training and ongoing supervision can be used successfully to train community service providers in empirically-supported treatments for PTSD.[38-41]

Training methods must be developed that establish competence with, not just rigid adherence to, the interventions. Methods of establishing competence in efficacy trials are labor-intensive and not feasible for ongoing monitoring in practice settings. It will be possible to monitor adherence and competence closely during training (eg, videotape review and scoring); these will need to be maintained via ongoing supervision and questionnaire assessment. Periodic continuing education will be necessary to sustain professional skills at a high level.

It will also be important to build practitioner support for the interventions themselves, in order to reduce attitudinal barriers. Some support-building can be expected to occur as a result of training and supervision, as trainers directly address practitioner concerns, provide a rationale for the treatments (including evidence-based), and correct misunder-

standings about them. When providers gain first-hand experience with the interventions, particularly if they see a benefit for patients, it is likely that they will become more supportive of them.

A third component of any attempt to increase use of complex treatment protocols will be management support. Adler, Kwon, and Signer[42] proposed that diffusion capability in organizations will only emerge under conditions of strong, participative leadership. Research suggests that involvement of a "champion" is associated with successful change. Within VA, such champions must likely be individuals respected and networked in the field locally, capable of persuading other critical players to become proactively involved. They must be sensitive to the perspective of local providers and address local issues that will help a best practice become accepted. Fundamentally, the goal here is cultural change management. The local group composed of champions, supporters, and providers ultimately becomes what is known as a "community of practice" (see below). These communities of practice are one essential component in building cultural change. This process of change often will require support from outside the site or region involved, and the VHA BPKM committee is proposing a KM infrastructure that will ultimately be crucial to spreading best practices nationally. The critical role of management support is stressed consistently in the KM literature, and VA leadership will need to visibly support dissemination efforts and create incentives that support use of recommended treatments.

Pilot Testing the Implementation Process

The BPKM committee has recognized that, in promoting use of complex clinical practices, the next step after an intervention has been developed/selected should be pilot testing to explore

whether it works as anticipated, and to examine factors that affect implementation.[20] Therefore, a pilot implementation of the cognitive-behavior treatments is under consideration.
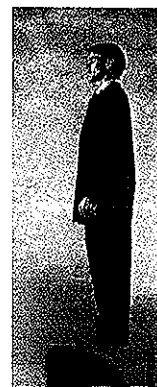
This pilot would serve several key purposes. First, it can evaluate the effect of delivering the interventions on important outcomes, including patient (eg, changes in mental health symptoms, functioning and quality of life, consumer satisfaction) and provider (eg, attitudes, engagement) outcomes. KM is designed to change provider behavior to improve patient outcomes, so measurement of outcomes is necessary to establish the value of KM projects.

> *"Active" strategies for behavior change [must] be employed; rather than simply increasing awareness or providing information about new practices, it is important that practitioners are trained in their use and supported as they implement changes.*

Any investment in dissemination of evidence-based treatments is based on an assumption that these treatments will perform better than existing services, but to date, the large evidence bases for PE and CPT have been generated primarily with non-VA patient populations treated by specially trained and monitored expert providers. Tests of CBT effectiveness with female and male veteran outpatients with chronic combat-related PTSD are under way (Schnurr, Friedman, and Engel, 2005, personal communication),[43] and effective use of CBT by healthcare providers who are not expert in CBT traumatic stress treatments has been documented,[38] but additional demonstrations of effects on veterans when delivered by existing program staff and

relative to existing treatments are required before an argument can be made that the interventions should be extended throughout the VA system. These data will be important, as well, in persuading clinicians to adopt CBT approaches.

Monitoring systems will be necessary to determine whether and how well evidence-based services are being delivered, and how such altered delivery is related to patient outcomes. A potential KM strength in VA is its long history of PTSD treatment program monitoring[22] and the ongoing routine monitoring, at the national level, of residential PTSD treatment programs. In order for this monitoring system to serve the present purpose, it would need to be augmented to permit monitoring of key variables related to the KM process, including outcome monitoring in PTSD outpatient settings and measurement of practice patterns in PTSD treatment. With regard to the latter, accurate knowledge about what is being delivered is important in order to establish that a KM dissemination effort has actually changed practice. Addis[10] identified as an important obstacle to dissemination the fact that we know little about the nature of what is being delivered as "treatment-as-usual" (TAU). In fact, TAU changes from setting to setting in VA PTSD treatment services.

These data are necessary to enable reliable interpretation of comparison

(control) program effectiveness in assessing the impact of pilot dissemination programs. This is not an insurmountable problem, but it does require careful thought. The most common TAU option is to simply monitor current outcomes without making any intervention and to compare them with outcomes from sites utilizing the newer (eg, CBT) interventions. This would be the most likely approach in KM dissemination. Other, more rigorous approaches involve manualizing TAU and comparing outcomes from such treatment with CBT; this approach is more appropriate for treatment efficacy research and not likely to be utilized in a general KM process.

A second reason for mounting an implementation pilot is to learn what factors impede or enhance the adoption of the CBT methods. In the proposed pilot study, focus groups would be conducted and questionnaires would be administered before, during, and after implementation to assess these factors. It is essential to monitor clinician/program experiences in implementation of best practices. KM is intended in part to help the organization "gain insight and understanding from its own experience,"[44] and, as Addis noted,[10] "practitioners have much knowledge to offer about the viability of using empirically-supported treatments in clinical settings. They can provide feedback about the helpfulness of different training experiences, particular clients or situations that present opportunities or obstacles to using empirically-supported treatment approaches, and the systemic contingencies that affect use of these treatments." In fact, one key step in the innovation process within an organization is the "redefining/restructuring" that occurs as the organization modifies an innovation in order to fit the organization's structure and needs, and as the organization itself changes to fit the innovation.[14]

KM generally "works best when implemented by, with, and for the community of practice it's meant to serve."[45] This means that KM should include the development of systems for encouraging communication among PTSD providers regarding the new practices. Such systems, together with the application of focus groups and formal measurement tools, will enhance understanding of the perspectives of these primary "customers" of dissemination efforts. One of the problems with previous efforts at dissemination may have been their unidirectional nature; emphasis has been placed primarily on changing practitioner behavior in ways that have been decided by researchers or administrators. This is a problem in shaping the behavior of professionals:

> "To the extent that professional tasks are nonroutine, their effective performance requires committed performance rather than perfunctory conformance. Extrinsic controls...are not only difficult to implement — because the tasks are difficult to meter and monitor — but also ineffectual as a means of eliciting appropriate levels of commitment."[42]

If a system of gathering information on clinician perspectives is part of a comprehensive management system, this will provide one means of building a partnership with those being asked to change as well as a way of ensuring that clinicians have input to the knowledge management process itself. One means of building such partnerships is to establish "Communities of Practice."[46,47] Communities of practice are defined as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. Within organizations, communities of practice enable practitioners to organize around concrete issues to take collective responsibility for managing the knowledge they need. In the CBT pilot, CPT and PE communities of practice will be established to maximize the sharing of information and experiences. This information can build support among VA practitioners to modify delivery of the interventions based on implementation experience.

Like clinician views, patient concerns and needs are important. As noted earlier, patient resistance can sometimes interfere with dissemination and there may be some resistance to participation in CBT treatments. A monitoring system should therefore include systematic assessment of patient experiences with CBT during the implementation pilot period.

A final reason for mounting a pilot test of implementation is that it will allow the testing of key methodologies important to larger dissemination efforts. As discussed above, a training methodology must be developed and tested. But the pilot will also require use of instrumentation/technologies for assessing patient outcomes, studying factors affecting implementation, monitoring clinician and patient experiences with the intervention, and measuring what is delivered in treatment.

After the Pilot: Broader Implementation

If successful, the pilot dissemination trial will provide information about the range of factors affecting competent adoption of CBT, including clinician experiences and attitudes toward its use and patients reactions to receiving it. The trial will also indicate how the practice affects relevant outcomes. In the case of PE and CPT, a controlled implementation trial will enable a data-based comparison with TAU in terms of PTSD symptoms, patient functioning, and patient satisfaction. Finally, the trial will enable the field testing of training/supervision methods and evaluation tools. If the trial indicates the potential advantage of wider dissemination of the given practice, it will be necessary to develop a system for spreading the practice throughout the VA. Ideally, the pilot will have enabled a refinement

of dissemination strategy, training methods, and measurement tools, so that these elements of a dissemination methodology will now be appropriate for delivery on a wider scale.

SUMMARY

We have suggested that successful implementation of best practices within a healthcare system like VHA requires developing and maintaining a KM system that can offer the critical infrastructure support needed to facilitate viable knowledge capture and implementation nationally. Such a system must provide an ongoing mechanism for identifying and prioritizing best practices and the staff support to help facilitate the implementation. When a key practice has been prioritized for dissemination, a strategy for dissemination must be designed, based on a careful assessment of the context of dissemination Then, depending on the intervention and an intervention-specific assessment of likely obstacles, an implementation pilot test should be undertaken, to learn more about barriers to implementation and to establish both that the specific practice can be successfully changed and that the new practice improves patient outcomes as compared to practice as usual. During the pilot test it will be important to monitor practice patterns, practitioner experiences with the practice, patient outcomes, and patient experiences as recipients of the practice. Finally, if the pilot implementation project is successful, a larger implementation effort will be necessary for dissemination of the practice throughout the VA system. At that stage, fundamental to long-term success will be local (i.e., regional) reviews conducted before implementation to both assess local obstacles and to identify local champions and critical players in the required cultural change.

With the creation of its Best Practices and Knowledge Management committee, VA has recognized the importance

of KM and is attempting to explore its application within the field of mental health. But as evident from the previous discussion, successful knowledge management, even when organized around a delimited domain such as PTSD treatment, is a complex undertaking. Knowledge management in health care will require a sustained effort, an ongoing commitment to establishing, monitoring, evaluating, and improving the ways that new knowledge can influence clinical care. Historically, in most healthcare systems, the selection and implementation of dissemination strategies and interventions have not been based on carefully developed theories or on thoughtful assessment of the variables likely to be most important in affecting a given target for practice change.[20] Knowledge — research findings, professional expertise, performance data, and organizational experience — has not been managed in a way that maximizes its utility for enhancing quality of patient care and guiding organizational performance improvement. In this article, we have discussed some of the issues related to PTSD knowledge management in VA and described first steps in developing and pilot testing a system for dissemination of empirically-supported best practices and, more generally, improving knowledge management throughout the VA system.

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